

Dimensions and Measurements of Waveguide-Coax Launchers in Schottky Pickup for Recycler and Tevatron

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This note is a document about dimensions and measurement results of waveguide-coax launchers installed in waveguides of Schottky Pickups for Recycler and Tevatron.

A Schottky pickup consists of rectangular beam pipe and two waveguides on top and bottom of the beam pipe (Figure 1.) The wall between waveguide and beam pipe is made of slotted thin aluminum foil for coupling signal into waveguide. The designed operating frequency is ~ 1.745 GHz (DELTA mode) and ~ 1.813 GHz (SUM mode.) Two waveguide-coax launchers are used at end of each waveguide to transfer signal through coax cable and hybrids to measurement devices

Coaxial ports of all launchers use SMA type connector. Shown in Figure 2 is a schematic drawing of the launcher along the longitudinal direction (beam direction) of the arrays. The unit in these drawings is inch. The corner joining waveguide longitudinal wall and its end is a round one with radius of 0.5 inch. Detail of these launchers can be found in mechanical drawings (ME326569, ME326570.)

Shown in Figure 3 is measured S11 parameter of a launcher with a section of WR430 waveguide terminated with a waveguide termination. All 16 launchers have almost identical performance. This result shows that all launchers matched very well: reflection is ~ -26 - -27 db or lower over full bandwidth which is ~ -5 db better than commercial launchers

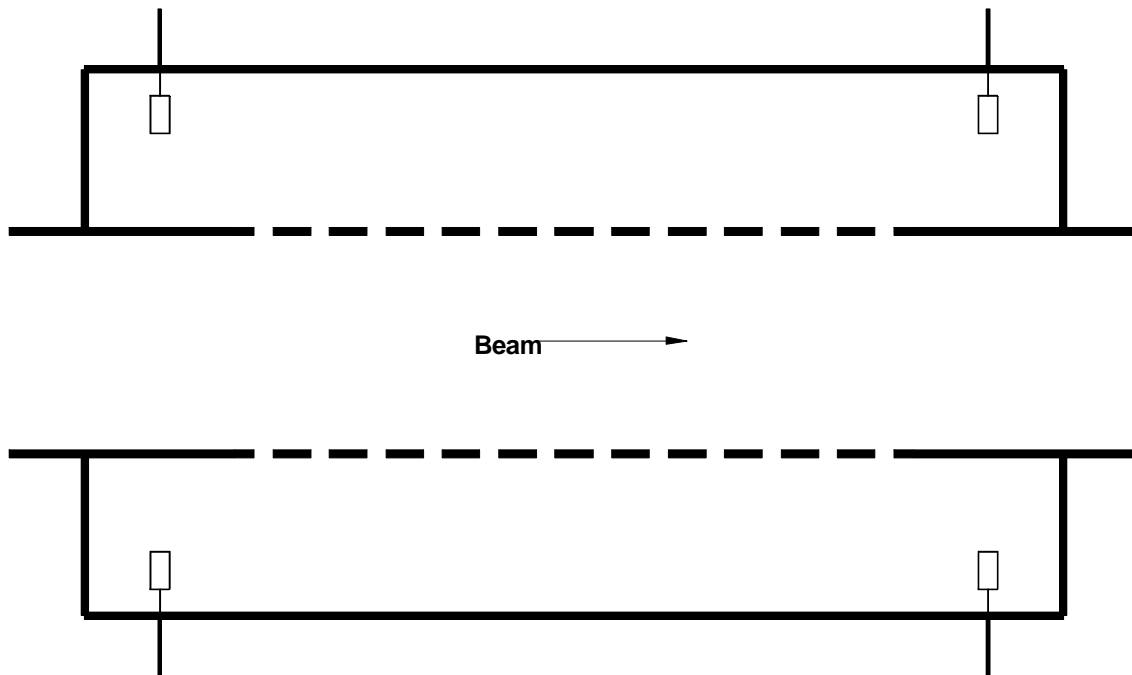


Figure 1. Schematic drawing of Schottky pickup

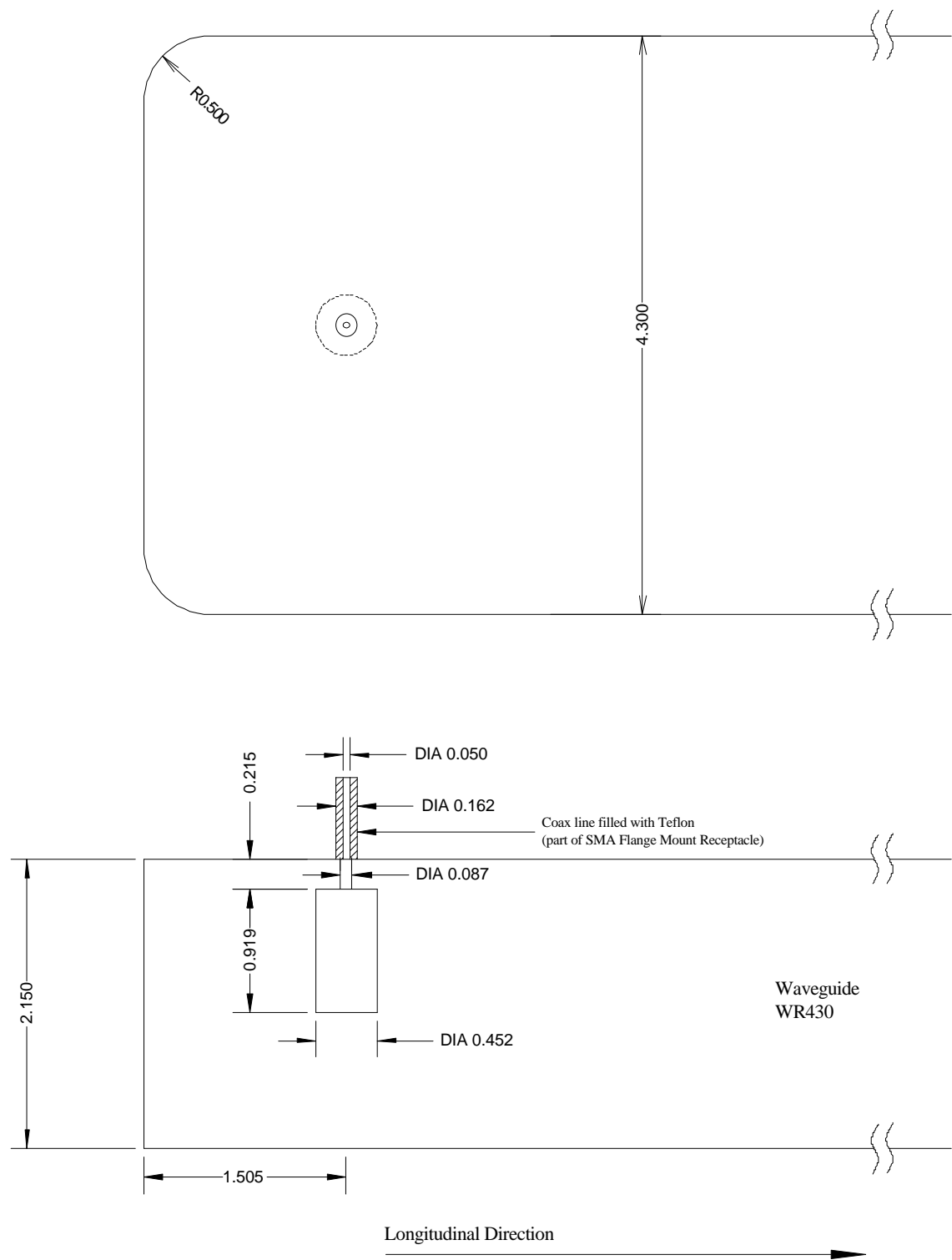


Figure 2. Schematic drawing of a launcher and waveguide (WR430) (unit: inch)

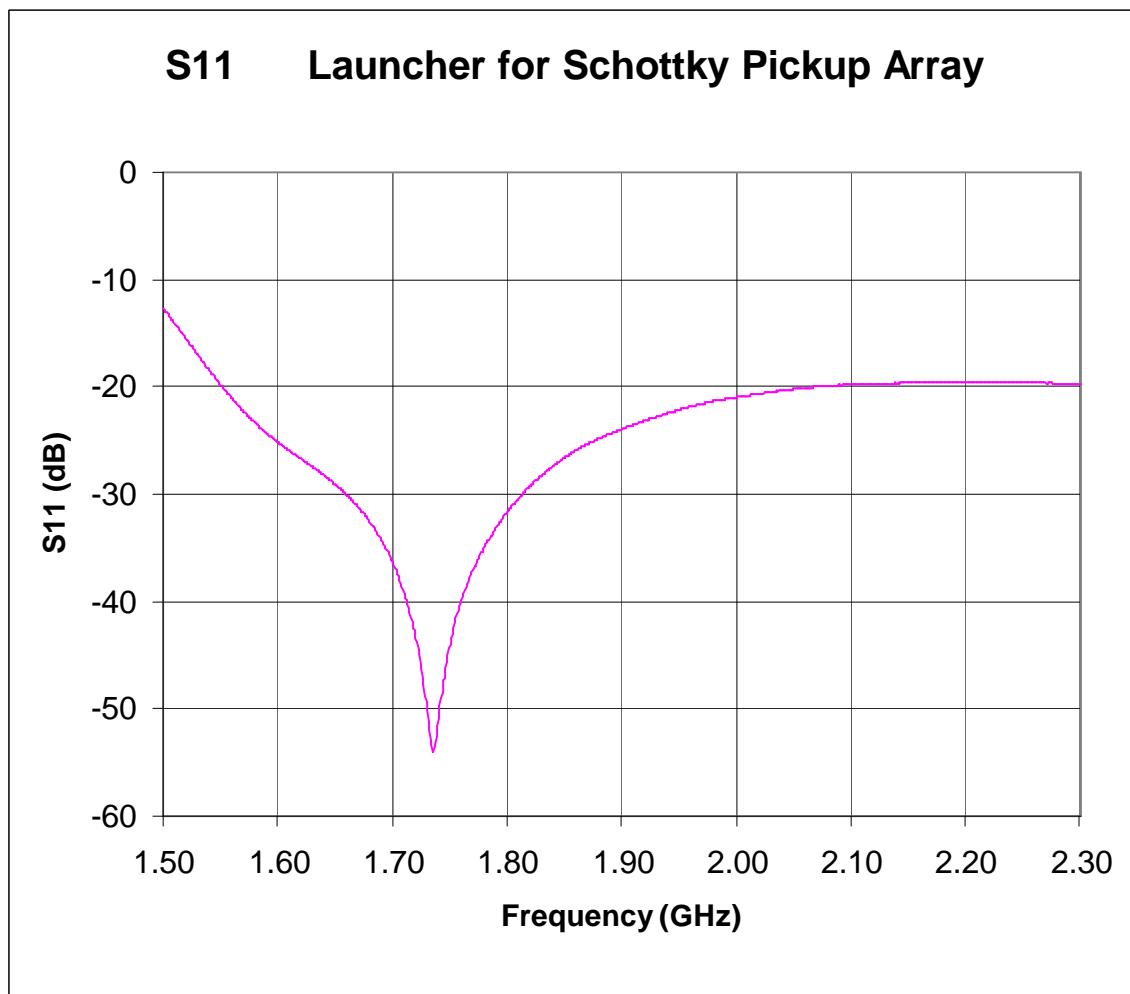


Figure 3. Measured S11 of a launcher